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VI. *Report of a remarkable appearance of the Aurora Borealis below the Clouds.* *By the Rev.* JAMES FARQUHARSON, *LL.D., F.R.S., Minister of the Parish of Alford.*

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ALFORD, February 24, 1842.—Saw, at 11 P.M., a remarkable aurora borealis, between the observer and lofty stratus clouds. The density of the clouds, the great brilliancy of the meteor, its considerable continuance, its renewed display, and the extent of space it occupied, left no doubt of the reality of the phenomenon.

After a day, during which the whole heavens had been mostly shrouded by a uniform cloud, with a gentle wind at N.W., the sky, after sunset, became partially clear; and the thermometer descended to 34°, with calm. Barometer 28·89 inches. At 11 P.M. a very brilliant display of pencils of aurora (streamers) was seen at W. by S., in a limited space about 10° broad, and 15° or 20° high, a little above the visible horizon; and a separated display of the same, much wider, and of nearly the same height, but not quite so brilliant, in another limited space at N.W. It was instantly seen that in both spaces the bright meteor was between the eye and lofty stratus clouds. These clouds extended in long parallel belts, some of them 10° or 15° broad, some broader, with narrow intervals of clear sky between them, in a direction from N.W. to S.E. This arrangement was clearly seen in all the western part of the sky, although there existed under these clouds thinner fleecy irregular ones, which here and there obscured it for short distances. These lower irregular clouds prevailed more in the eastern part of the sky; but there, also, the arrangement of the belts of stratus was recognised through their intervals. One of the irregular thin clouds lay over the moon, then nearly south, and nearly at full; and its consistency was such as to obscure the dark spaces on her disc, although not its circular outline. The lofty stratus clouds, were, in some parts at least, of much denser consistency; as was proved by their totally obscuring some very brilliant falling stars, which passed behind them, as will be afterwards described.

The exhibition of pencils of aurora at the W. by S. space was of unusual brilliancy, and the coruscations incessant, as they brightened up, and faded, and suddenly disappeared, and were renewed, successively. The colour at the lower extremity was a lively minium red, but only for a short way up; the upper part being of the common greenish yellow. They crossed, angularly, the lofty cloud nearest to the western horizon, which was narrow, and were clearly seen upon its face, and stretching their extremities into the clear sky on each side of it. Even the feeblest of them maintained its continuity and its peculiar tinge of colour, over both the thinner

edges, and denser middle part of the stratus. About five minutes after it was first seen, this aurora became extinct; but in the course of three or four minutes was suddenly renewed, with a slight shift to the southward, in as great or even greater brilliancy. In the mean time, the aurora at the N.W. space exhibited like appearances, and colours; red at the lower extremities of the brilliant pencils, and greenish yellow upwards. The space here occupied by the pencils, or streamers, was much broader, and the lights less condensed into one place, disappearing in some compartments and extending to others alternately. They played over several belts of the stratus clouds, and intervening clear spaces of sky; and were seen, without diminution of lustre or change of tinge, on the face of the former. At both sides of this space, there were some of the thin irregular lower clouds, behind which some of the pencils passed, sometimes at one or other of their extremities, sometimes at their middle part. In such cases their continuity instantly disappeared; for although the light of the more brilliant ones shone through these clouds, it was only in a white nebulous form, without any parallelism of rays, as seen in the pencils when not so obscured.

About twenty minutes after the aurora was first seen, dense clouds with curled edges were rather quickly formed over both the spaces occupied by it, of larger extent than they were; and although the observations were continued till half-past twelve o'clock, the meteor was not again seen in the same spaces; but about a quarter to twelve o'clock, a comparatively small space of bright nebulous aurora, without defined pencils, was seen very near the horizon at W.N.W. That too disappeared; and in the mean time the clouds in all parts of the sky by degrees dissolved; the lofty stratus ones more slowly than the others. At half-past twelve o'clock, only a few remained at the S.E., when the observations were discontinued.

During the continuance of the aurora, two bright shooting stars descended above the space at N.W., in paths parallel to the streamers, that is to the dipping-needle. They were of slow motion, and became invisible when passing over the belts of stratus clouds, but emerged again after passing them. At a quarter to twelve o'clock, a shooting star, as large as Venus at her greatest elongation, shot from near the zenith a little to the eastward of the magnetic meridian, and descended in a path parallel to that circle, disappearing while passing behind some stratus clouds, but not quite while doing so behind some low irregular ones, that lay in its course. Its motion was slow, and fitfully interrupted.

February 25th.—Clear sky in the morning. Unusually abundant spiculæ of hoar frost over all the ground, and whitening the hills to their summits, like a shower of snow. Register thermometer through the night at 29°.